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sealed again without introducing any foreign substance, gave such a large percentage of fatalities that too large a percentage of fatalities in the experiments proper should not be attributed to the reagent.

Magnesium Chloride.—The magnesium chloride was employed as a 10 per cent., 16 per cent. and 33 per cent. dilution of the molecular solution of the salt in normal salt solution; that is to say, ten parts of the molecular solution of magnesium chloride were diluted with ninety parts of normal salt solution; etc.

The reagent was introduced into the eggs in the same manner as was the chlorotone; in some cases into fresh eggs, in other cases into the eggs after they had been in the incubator from ten to twenty hours.

The effect of these weak magnesium chloride solutions was about the same as the chlorotone, the embryos being killed in practically every case, or, at least, the process of incubation was inhibited. As in the case of chlorotone the results were here largely vitiated by faulty technic in opening and closing the eggs for the introduction of the reagent.

These preliminary experiments, as has been said, while too limited in number to give definite results, will serve as a guide for further work, especially in regard to the character and strength of reagents and the length of time they should be allowed to act.

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INHIBITION OF CELL DIVISION IN PARAMÆCIUM

IN connection with the discussion of "potential immortality" in Protozoa (in other words, their ability to continue their physical existence indefinitely, barring accident and disease, through the bodily "splitting up" of each individual into its two offspring, each repeating the process, which is continued "*ad infinitum*"") it may be of some interest to note the length of time an individual has been observed to maintain its identity—in other words, to continue living, without dividing into its progeny. The writer has suc-

ceeded in preventing one specimen of *Paramæcium caudatum* from dividing, for the space of a little over thirty-two days, by keeping it confined in capillary tubes of bores too small to permit it to turn back readily.

Control specimens had meanwhile divided on an average of once a day. In other words, if the confined specimen had been allowed to divide unmolested, it would have divided into four billion, two hundred and ninety-four million, nine hundred and sixty-seven thousand, two hundred and ninety-six offspring!

The irritation caused by the confining walls is doubtless a factor of as great importance as the accumulation of the products of excretion, and the lack of nutrition; since specimens which were daily taken from their tubes and allowed to swim about in a fresh infusion containing an abundance of *Bacterium termo*, for a number of hours before being transferred to new tubes, nevertheless refused to divide.

Particles which appear to be cast-off portions of the specimen's body, were frequently observed in the tubes with individuals thus treated, thus suggesting that increase of protoplasmic bulk may take place without the customary sequence of cell division, even in well-nourished individuals.

Conklin's observations on *Crepidula* seem to indicate that the dwarfing of those forms in small hermit crab shells (dwarf forms being always found in small hermit shells, and "giant" forms in large hermit shells) is due to an inhibition of cell division, since the difference in size is due to the difference in the number of cells, rather than to differences in cell size. Crustacea, Echinodermata, Mollusca, Amphibia, etc., reared in small vessels are always dwarfed, and this too must be due to an inhibition of cell division.

In the case of *Crepidula*, the fact that the hermit shells are open to the ocean would indicate that the accumulation of waste products, and lack of proper nutrition can hardly be regarded as a sole, or even the chief, cause of this inhibition of cell division, and the writer is inclined to the opinion that narrower confinement in some way acts as an important factor in the process.

If a dwarf *Crepidula* be removed from a small hermit shell, and find lodgment elsewhere, it is readily seen that the inhibitory influence was merely temporary, since the dwarf then grows to the normal size. So too the confined *Paramœcium*, after being liberated, soon begins the process of fission at the normal rate.

A more detailed account of these experiments, together with some observations on the behavior of Protozoa confined in capillary tubes, will shortly appear in another publication.

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SOCIETIES AND ACADEMIES

THE MICHIGAN ACADEMY OF SCIENCE
SECTION OF ZOOLOGY

THE zoological section of the Michigan Academy of Science met at the University of Michigan, March 28. Mr. Peter Okkleberg was chosen president for the coming year. The following program of papers was presented:

"Results of the Merston Expedition to the Charity Islands, Lake Huron, Amphibians and Reptiles," Crystal Thompson and Helen Thompson, Ann Arbor.

"Some Bird and Mammal Records for Michigan," N. A. Wood, Ann Arbor.

"Directions for Collecting and Preserving Specimens of Reptiles and Amphibians for Museum Purposes," Alexander G. Ruthven, Ann Arbor.

"The Breeding Birds of the Charity Islands, Lake Huron, with Additional Notes on the Migrants," N. A. Wood.

"On the Wisconsin Wood-frog," Helen Thompson.

"The Pickerel Frog, *Rana palustris* LeConte, in Michigan," Crystal Thompson.

"External Conditions and the Growth Period in the Eggs of *Hydatina senta*," A. F. Shull, Ann Arbor.

"The Influence of Egg and Sperm in Inheritance of Egg Characters in *Hydatina senta*," A. F. Shull.

"The Origin of Continental Forms, 3. A Preliminary Note on Faunal and Floral Relations," Howard B. Baker, Detroit.

"A Collection of Mammals from Osceola

County, Michigan," Orrin J. Wenzel, Ann Arbor.

"The Mouth Reflex of Physa: May it be Substituted for the Salivary Reflex of Pawlow in Studies of the Nervous System of Snails?" Elizabeth Thompson, Ann Arbor.

"Pseudohermaphroditism in the Brook Lamprey," Peter Okkleberg, Ann Arbor.

"Factors that Determine the Location of the Borings of the Yellow-bellied Sapsucker in the Yellow Birch," Margaret W. Taggart. (Presented by Jacob Reighard.)

"Report on the Zoological Work done at the Biological Station of the U. of M. at Douglas Lake," Jacob Reighard, Ann Arbor.

"Cestode Parasites of Fresh-water Fish," George R. La Rue, Ann Arbor.

"New Methods of making *in toto* Preparations," George R. La Rue.

"The Distribution of the Ancyliidæ," Bryant Walker, Detroit.

"Preliminary Report on the Ecology of the Mollusks of the Douglas Lake Region," H. Burrington Baker, Ann Arbor.

"The Origin of the Germ Cells in the Toad Fish," Emory Sink, Ann Arbor.

"The Application of Calorimetric Methods to the Study of Embryology," O. C. Glaser, Ann Arbor.

"Notes on the Amphibia and Mammals of Gratiot County, Michigan," H. M. MacCurdy, Alma.

"Check-list of Michigan Lepidoptera. I. Rhopalocera (Butterflies)," W. W. Newcombe, Detroit.

"Some Observations on the Muskrat Houses near Ann Arbor," F. C. Gates, Ann Arbor.

"On some Amphibians and Reptiles from the State of Vera Cruz, Mexico," Alexander G. Ruthven.

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THE HELMINTHOLOGICAL SOCIETY OF WASHINGTON

THE tenth regular meeting of the society was held at Dr. Stiles's residence on March 14, 1912, Dr. Stiles acting as host and Mr. Crawley as chairman. The receipt of a set of author reprints from Dr. Arthur Shipley for the society's library was noted.

Dr. Stiles reported that the Index-Catalogue of Medical and Veterinary Zoology dealing with the subjects Cestoda and Cestode Diseases, by Stiles and Hassall, was now in manuscript ready for